U.S. Antarctic Marine Living Resources Program

2012-2013 Weekly Field Reports
Cape Shirreff, Livingston Island

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Science Report

Seabirds

1. We are starting to see chinstrap penguin chicks forming crèches. 58% of the chinstrap reproduction nests are brooding at least one chick, 35% have failed, and 7% have crèched. In the second week since peak gentoo hatch, 32% of reproduction nests are brooding at least one chick, 66% have failed and one nest has crèched.

2. We continue to monitor known-age penguins. Of the 38 gentoo penguin nests, 34% are brooding at least one chick, 63% have failed, and 2% have crèched. Of 59 known-aged chinstraps that have initiated clutches, 46% are brooding at least one chick, 53% have failed, and 1% have crèched.

3. We have almost finished weighing chicks from the reproduction study and known-aged breeder nests. The mass is recorded from these chicks at 21 days old to determine their condition before crèche.

4. We finished deploying radio tags on gentoo penguins this past week. We currently have 19 radio tags deployed on gentoo penguins and 19 on chinstrap penguins. The radio transmitters are used to measure foraging trip durations during the chick-provisioning period.

5. Currently we have 4 Time Depth Recorders (TDRs) and 6 Satellite Transmitters (PTTs) on gentoo penguins brooding chicks and 5 TDRs and 4 PTTs on brooding chinstraps. The satellite transmitters will be used to determine where the penguins forage and the time-depth recorders give profiles of diving behavior. We will recover these instruments after one week of deployment. We have successfully recovered 2 PTTS from chinstrap penguins and will retrieve the other instruments in the coming days.

6. We have had a visiting macaroni penguin hanging out in a few of our penguin colonies for the majority of the week.

7. We continue to sample the diets of the penguins using the wet offloading technique. To date, we have collected samples from 20 chinstrap penguins and 10 gentoos. We record total mass of stomach contents, diet composition, and length and sex frequency of krill for each sample. Chinstrap penguin diet samples have consisted almost entirely of Antarctic krill (*Euphausia superba)* with trace amounts of fish. Gentoo penguin diet samples were a mix of Antarctic krill and fish.

8. Of the 17 brown skua territories that are regularly monitored, 47% of these nests have one chick, and 53% have failed. We banded 5 of these chicks this past week.

Pinnipeds

9. Twenty of our 30 CCAMLR attendance females have completed six trips to sea, seventeen of which did so before losing their pup. To date seventeen of the 30 have lost their pups.

10. We currently have five remaining time-depth recorders (TDRs) deployed on females for monitoring diving behavior. No TDR's have been recovered this week. Seven other previously deployed TDR instruments have been recovered; two have been excluded from the attendance sample because they lost their pups. Six of the seven were GPS-TDRs. Of the TDRs recovered we have collected foraging location and diving data on 24 foraging trips. Mean trip duration for these females was 3.82 days (s.d. = 1.92; range: 0.76 - 8.12 days).

11. Trip durations continue to be longer than average for the sixteen years we have been monitoring. Seventeen of the thirty attendance study females completed at least six trips to sea before they lost their pup and ten completed at least seven. Trip durations are as follows: first trip: 3.97 d (s.d .= 1.97, n = 26); second trip: 4.79 d (s.d .= 2.23, n = 25); third trip: 4.77 d (s.d. = 1.38, n = 25); fourth trip: 4.36 d (s.d. = 1.55, n = 25); fifth trip: 4.74 d (s.d. = 1.26, n = 24); sixth trip: 4.82 d (s.d. = 1.08, n = 17). The maximum trip duration remains at 8.91 days.

12. Thirteen of the pups of the 17 females that have completed six trips to sea have been weighed according to protocol. Mean mass gain from the start of female foraging cycles to completion of the sixth trip suckling bout is 84.6 g/d (s.d. = 24.12; n=13; range: 42.3-122.6).

13. We continue to monitor the 164 mother pup pairs in our adult tagged female population to get a measure of reproductive success and loss of pups due to leopard seal predation. Pups are now actively playing and swimming off shore where they are easily accessible to leopard seals. Our current estimate for pup loss to leopard seal predation as of yesterday (27 Jan) is at 20.1%.

14. We captured one fur seal this week to retrieve our final over winter geolocation light sensor (GLS) for females that have returned from their over-winter migration. We hope to retrieve more in the coming weeks from seals that have not yet returned.

15. We are currently collecting our fifth fur seal diet sample of ten scats. To date 59 scats have been collected, and 21 have been processed.

16. On 25 January we completed our tenth weekly Cape-wide Phocid census. We counted 274 southern elephant seals, 29 Weddell seals, and 24 leopard seals.

17. Leopard seals continue to arrive and as of 27 January we have recorded 196 sightings of 28 tagged seals. We have recorded an additional 42 sightings of untagged or otherwise unidentified seals. Twenty of the 28 tagged seals returned from previous years and the other eight we have tagged this year.

18. This week one GPS location instrument was deployed on a leopard seal, and another was recovered. These instruments together with stable isotope analysis of blood will help us understand leopard seal foraging behavior and quantify their impact on Antarctic fur seals. To date we have successfully performed seven leopard seal captures on four animals.

19. We continue to operate the APH-22 hexacopter in order to map/census penguin and fur seal breeding colonies and to photograph leopard seals to measure length and girth. One calm, clear afternoon allowed us to deploy repeatedly on leopard seals and penguin colonies. We obtained full coverage of all penguin colonies at 100' and 200' and the results look promising.

Weather

20. Our streak of precipitation has continued this week, leaving 0.44 inches. Though our season total of 1.5 inches is still less than half of our total last year. Winds averaged 7.3 mph with a maximum wind speed of 36 mph. Wind direction was fairly evenly split between East (35.9%) and West (35%) with a substantial amount coming from the south (22.1%). The average temperature was 1.40° C with a high of 4.2° C and a low of -0.4° C. Mean daily solar radiation was 13,144 Wm^2. Sunrise is now at 4:19 am and sunset is at 10:00 pm.

Camp

21. On 25 January the human population of the Cape was again adjusted. Kyler Abernathy, Director of Research for National Geographic's Remote Imaging program, departed at 22:35 on the M/V *National Geographic Explorer*. Thank you to Lindblad/National Geographic for excellent continued support. The current population is 13 people, six in the American camp, and seven in the Chilean camp.

22. One calm afternoon afforded a chance to continue much needed camp maintenance. A section of decking north of the workshop was repaired, and various piles of support gear were organized and stowed off the deck into fish boxes. The supply hut got a much needed cleaning. Finally, two non-functional generators were serviced and are now both running well.

23. The precipitation this week was much needed. Twelve of our sixteen 50 gallon water storage barrels are now full.

Presented by Doug Krause and Jefferson Hinke, with assistance from Nicole Cook, Jay Wright, Melany Zimmerman, and Michelle Goh at the Cape Shirreff Field Camp, Livingston Island, South Shetland Islands, Antarctica